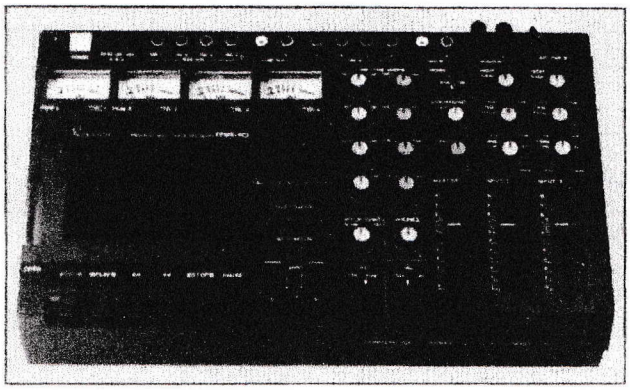
PERSONAL MULTITRACK RECORDER

MR-10



OWNER'S MANUAL

Vesta FIRE

Introduction

The Vesta Fire MR-10 is the result of years of designing and manufacturing appliances in the home recording field.
The MR-10 is basically a mixer and a multi-track recorder which are internally connected. The MR-10 can perform all the basic multi-track functions: multi-track recording, overdubbing, ping-pong recording and remixing. It offers all the standard features plus some unique ones such as phono inputs and others.
The MR-10 is an extremely flexible tool for anyone involved in multi-track production.

THE RECORDER SECTION

The MR-10's track format is compatible with standard audio cassettes. The tape moves at 1-7/8 ips (4.8 cm/s), and thus you can also play back standard stereo cassettes with the system. Use your Hi-Fi system deck to lay down popular songs, then overdub on the MR-10. You can record your favorite record tunes via the Phono inputs, while singing along with your friends to give the recording a personal touch. Or lay down tracks on the MR-10 and send the tape to other band members for practicing.
A pitch control, allowing tape speed control with ±15%, lets you tune the MR-10 to instruments and other tapes. You can create special effects too.
Switchable dbx* noise reduction gives clean, quiet recordings with plenty of headroom to avoid distortion. You can switch off the dbx circuit in order to play back tapes which have not been dbx-encoded.
Remote Punch-in and Punch-out are simple and easy, using the Remote Foot Switch FP-1. This is an invaluable tool when overdubbing all or just portions of a track. Any input or combination of inputs can be routed to any single track or to selected pairs the PAN control and the Record Function switches.

THE MIXER SECTION

The MR-10's mixer is designed for high flexibility to allow the MR-10 to adapt to a variety of applications. The mixer section gives you ten inputs: two Main inputs, four Line inputs, two Phono inputs and two Aux inputs.
Each Main input has its own fader 40dB trim control, handling guitars, mics, keyboards and synthesizers with ease, and two-band EQs.
The Aux/Phono mixer consists of Level and Balance controls, and accepts signals from Aux IN and Phono IN, combining them with the L/R buss line signals.
The Line/TRK mixer operates in two ways. When mixing down, each recorded track goes through Level and Pan, and is assigned to the L/R Master outputs. During initial recording, signals from the four Line inputs are mixed and go to the L/R buss line. Finally, thanks to the monitoring function you can listen separately to pre-recorded tracks and the input signals during overdubbing (Remix switch at PGM/OFF).

TRACK FORMAT

The MR-10 track format is designed with consideration to improving sync crosstalk while maintaining interchangeability with the standard cassette format. A tape recorded on tracks 1 and 2 of the MR-10 can be played on the regular format cassette decks with a tape speed of 1-7/8 ips (4.8 cm/s).
The MR-10 records and plays in only one direction using the entire width of the tape. So do not turn over the tape, or you will erase recorded tracks.

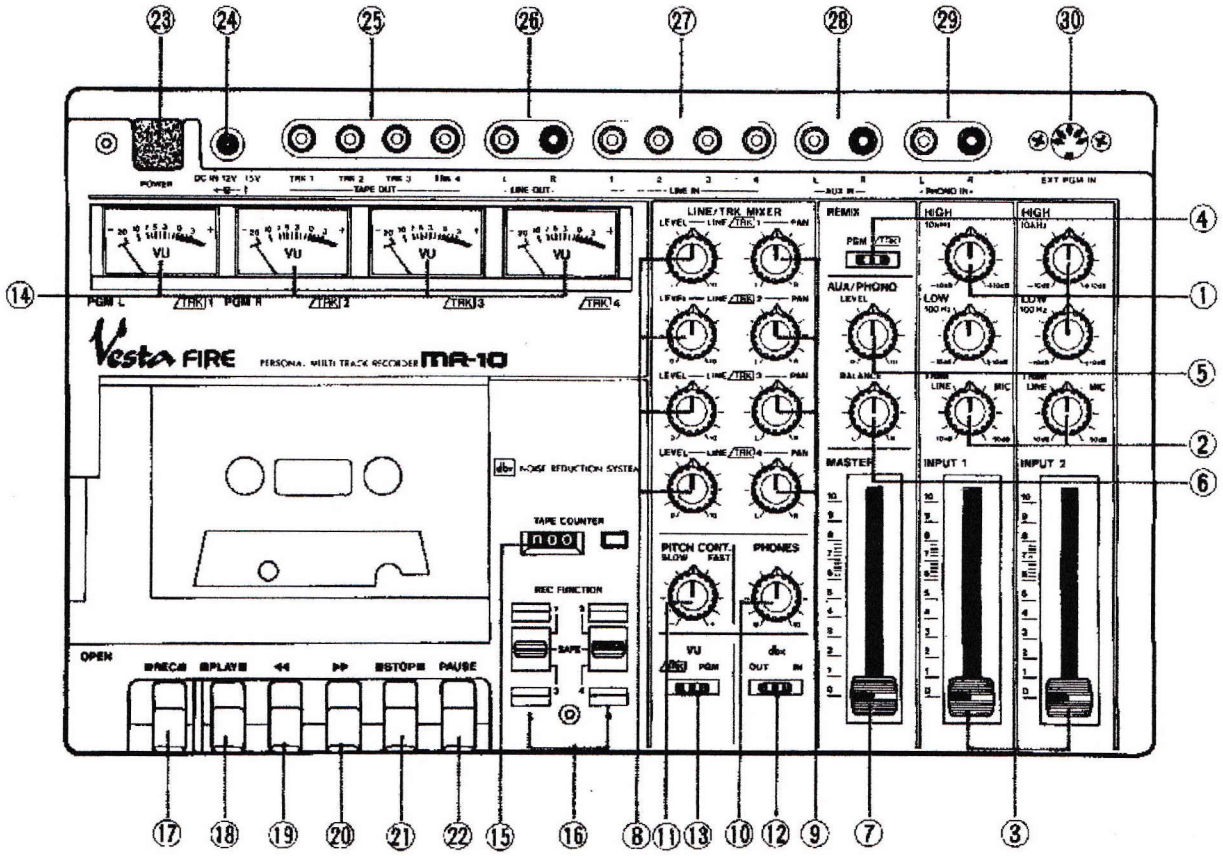
CASSETTE TAPE

Remove both safety tabs of the cassette in order to protect the finished master, or you may accidentaly erase the tracks of your master.
Do not use C-120 cassettes, as the extremely thin tape used in C-120 cassettes might lead to troubles from stretching and breaking. So, use the shortest possible tape for a given job.
In order to get the best results, use 70μs, High Bias, Type II tapes such as TDK SA X, MAXELL UD XLIIS or equivalent formulations.

This unit does not have a built-in power source or batteries. Use AC Adapter PS-15 (or DC-15) when using this unit.

*Trademark: dbx Incorporated.

Controls and Functions



① EQ HIGH/LOW (Equalizer Adjustment Knobs)
The Equalizer circuit consists of two knobs, with the upper knob allowing a boost or cut of 10 dB at 10 kH for the high frequencies, and the lower knob allowing a boost or cut of 10dB at 100Hz. As there is a tendency for losing highs when PING-PONGING, it is best to boost the highs somewhat when recording.
The MR-10 Equalizer is for input only and is biased for PING-PONGING and MIXING DOWN. Perform a sound test when you first use the unit.

② TRIM (Knob)
The TRIM control adjusts the level of the input signal from the 6.3ϕ (standard 1/4" phone) mic/line jack on the front of the unit to an appropriate volume. Turn the TRIM control fully clockwise (to the right) when working with low level signals, such as those from microphones, and counter-clockwise (to the left; for LINE level signals) when working with high level signals, such as those from a keyboard.

③ Input Fader
Varies the amount of the input signal from the 6.3ϕ (standard 1/4" phone) jack on the front of the unit.

④ REMIX PGM/TRK (Program/Track Switch)
When making an initial recording, use the TRK setting only for using LINE IN 1 — 4, PING-PONGING, and MIXDOWN.

⑤ STEREO INPUT LEVEL (Knob)
Use this knob to adjust the level when using the AUX IN L and R, or the PHONO IN L and R.

⑥ BALANCE (Knob)
Use when balancing left and right channels between AUX IN L and R, or PHONO IN L and R, for stereo use, or when balancing 2 inputs when inputting 2 different signals on LINE IN L and R. Turning the BALANCE knob to the left diminishes the signal from the right channel, and turning it to the right diminishes the signal from the left channel.

⑦ MASTER (Fader)
This stereo fader simultaneously controls the level of the signal assigned to the BUSSES L and R.

⑧ LEVEL (Level Adjustment Knobs) 1 — 4
The LEVEL knob allows adjustment of the playback signals on tracks 1 through 4, or of the 1 — 4 line input jack (RCA type pin) input signal levels.

⑨ **PAN 1 – 4**
The PAN control allows you to select assignment of playback signals on tracks 1 through 4, or of the 1 – 4 line input jack (RCA type pin) input signal, to either the left or the right BUSS line.

⑩ **PHONES (Headphone Output Level Knob)**
This control allows you to adjusts the volume of sound monitored at the headphones.

⑪ **PITCH CONTROL (Knob)**
This control changes the tape winding speed at ±15%.

⑫ **dbx IN/OUT (dbx ON/OFF Switch)**
You can decide whether or not to use the dbx noise reduction by means of this switch. Always set the dbx switch to IN when playing back signals recorded with dbx IN and to OUT when playing back signals recorded with dbx OUT.

⑬ **VU (VU Meter Changeover Switch)**
The VU switch controls the contents of the VU meter displays.
TRK → Displays playback levels from tracks 1 through 4, as well as LINE IN 1 – 4 input levels.

PGM → Displays the left and right BUSS line final output levels.

⑭ **VU Meters**
Respond to the average signal level and do not show peak levels.

⑮ **TAPE COUNTER (Tape Counter/Reset Button)**
A 3-digit display indicates tape transport condition and position. Pressing the reset button sets the display at "000".

⑯ **RECORD FUNCTION/LED**
This selects the recording track.
The L (Left) switch allows recording on tracks 1 and 3. At the central SAFE position no recording can take place. The R (Right) switch allows recording on tracks 2 and 4. At the central SAFE position no recording can take place.
The MR-10 allows simultaneous recording on 2 tracks, as the same BUSS track adjusts differently to tracks 1 and 3 and tracks 1 and 4.
REC FUNCTION LED flashes when the unit is on record standby, and stays lit when the unit is on record.

⑰ **REC (Record Button)**
Pressing this button puts the unit in the record mode.

⑱ **PLAY (Play Button)**
Pressing this button sets the unit on playback.

⑲ **REW (Rewind Button)**
Pressing this button rewinds the tape at high speed.

⑳ **FF (FF Button)**
Pressing this button winds the tape forward at high speed.

㉑ **STOP (Stop Button)**
Pressing this button stops all tape motion.

㉒ **PAUSE (Pause Button)**
Pressing this button during playback or record causes the tape to stop running (i.e., the electronics remain engaged). If during record, the PAUSE button has been depressed, and the Record button is pressed and the PAUSE button pressed once more, recording will resume instantly.

㉓ **POWER/POWER LED**
Throwing this switch switches the unit on and the LED lights.

㉔ **DC IN (AC Adaptor Jack)**
This jack is to connect the AC adaptor (Vesta FIRE PS-15 or DC-15 is recommended) or battery pack. (15V 400mA)

㉕ **TAPE OUT 1 – 4 (RCA Type pin Jack)**
Outputs the tape playback signal to all tracks. You may use them in mixing down with an external mixer.

㉖ **LINE OUT L/R (RCA Type Pin Jack)**
This jack is to output the signal mixed on the left and right channels by the MR-10's built-in mixer. Use to monitor output by connecting to the monitor amp, or connect to the master deck and MIX-DOWN. The signals output from the jack can be monitored on the headphones.

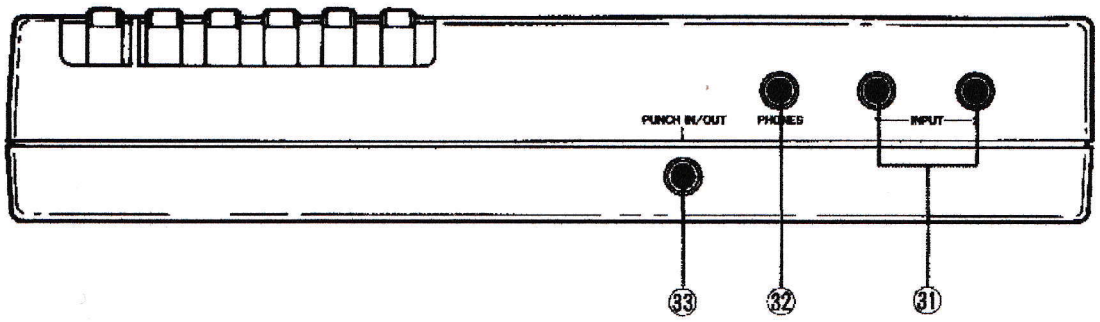
㉗ **LINE IN 1 – 4 (RCA Type Pin Jack)**
This is the 4-channel line level input. Connect a keyboard or drum machine. The signals input from this jack are assigned corresponding channel levels/pan controls and then mixed.

㉘ **AUX IN L/R (External Input Jack) (RCA Type Pin Jack)**
Line level stereo input. Signals input from this jack pass through the balance and are transmitted to the master control. Connect stereo output musical instruments, a CD player, or a tape deck.

㉙ **PHONO IN L/R (RCA Type Pin Jack)**
This input jack is for a phonograph (record player) only. Signals input from this jack pass through the level and balance, and are transmitted to the master control.
An RIAA equalizer is built into the phono jack input. Please note that connection of an audio source other than a phonograph (e.g., an instrument, tape deck, etc.) will distort the audio.

㉚ **EX PGM IN (Expander Connection Jack)**
For expanding MR-10's mixing capability, Expander unit EX-10 is in planning. Connect MR-10 to EX-10 with 5-pin DIN cable.

Front Panel



㉛ MIC/LINE IN 1/2 (6.3φ /standard 1/4" Phone Jack)
This jack is for microphone and instrument input. Signals input from this jack pass through the TRIM, Equalizer, and input fader and are transmittted to the master control.

㉜ PHONES (Headphones Jack) (6.3φ Stereo Phones Jack)
This jack is for the connection of headphones used for monitoring.
The headphone impedance should be over 8 ohms. Also, do not allow combined impedance to fall below 8 ohms when using more than 2 headphones.

㉝ PUNCH IN/OUT Remote Jack
Connect FP-1 Punch In/Out Remote Pedal for convenient hands-free operation. Remote operation is recommended for MR-10's punch in/out to get the best results.

Initial Recording

Procedure for Completing a Tape

With the MR-10, the following procedures obtain for completion of a 4-track multi-track recording.

INITIAL RECORDING
↓
OVERDUBBING → PUNCH IN/PUNCH OUT
↓ ↓
PING-PONGING (PING-POGING + OVER-
↓ DUBBING)
OVERDUBBING
↓
MIXDOWN

Here we will explain how to record with the MR-10 using as an example the recording of a total of 10 instruments in order.

When producing a tape, first record on track one the instrument that sets the tempo of the piece, such as the drum machine or whatever constitutes the base of the piece.

The MR-10's Mixer is capable of handling inputs of up to 10 channels, and the recorder can simultaneously record a maximum of 2 tracks.

Connection

1. The MR-10 is equipped with a variety of input terminals, including 2 mic/line inputs, 4 line inputs, a stereo auxiliary input (can also be used as 2 mono line inputs), and a stereo phone input. Choose the terminal to be used in accordance with the connected source, as per the following example. (The example shows a MIC/LINE usage.)

(1) **MIC/LINE IN 1, 2 (Front Panel)**
All sound sources – microphone, guitar, keyboard, drum machines, etc.
This terminal is most useful for recording one instrument at a time.

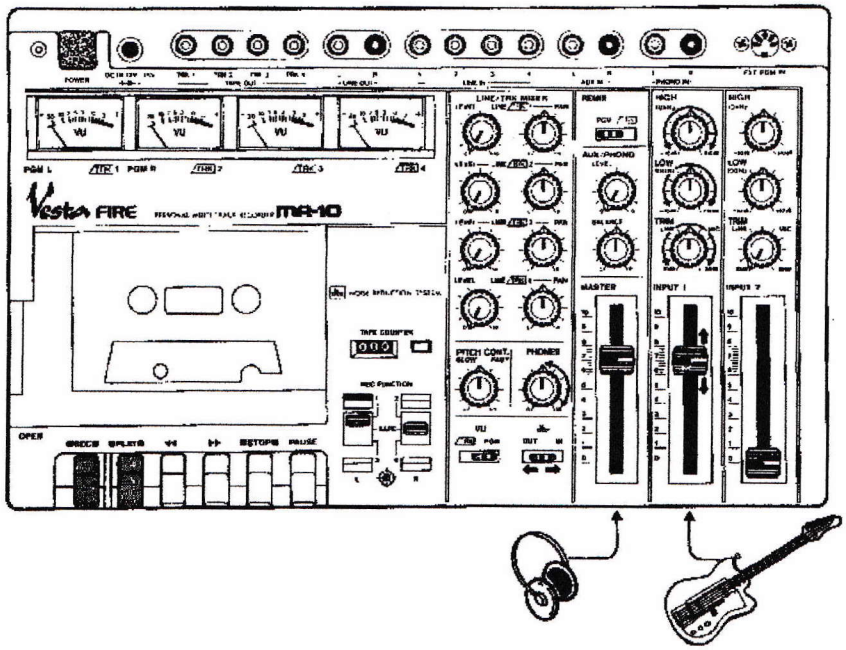
(2) **LINE IN 1 – 4**
For output levels above -10dB, such as keyboards, drum machines, tape decks, etc.

(3) **AUX IN L, R**
For output levels above -10dB, such as keyboards, drum machines, tape decks, etc. (Particularly useful for stereo source connections.)

(4) PHONO IN L/R
Stereo (phonograph) record player
(The RIAA Equalizer will distort the audio if something other than a phonograph is connected.)

Also, when recording several audio sources at the same time, the MR-10 is capable of handling a combined total of 8 channels of audio sources at the same time by judicious combination of the above input terminals (PHONO IN excluded).

2. When connection of the audio source to be recorded is finished, connect the headphones to the front panel PHONES jack.



Level Setting/Recording

1. Set the Master Fader to gradation 7 or 8 on the scale.
2. Set the VU Meter switch to PGM.
3. What constitutes an appropriate output level setting will differ depending on the connected terminal.

(1) When Using the MIC/LINE IN 1, 2 (Front Panel)
Adjust the TRIM Control according to the kind of audio source to be recorded.
Set to MIC for microphones, to LINE for keyboards, drum machines etc., and leave in the middle for guitars, bass etc.
The input signals from Input 1 are assigned to BUSS L, and the input signals from INPUT 2 are assigned to BUSS R. Adjust the INPUT 1 level adjustment fader while looking at the PGM L meter, and adjust the INPUT 2 level adjustment fader while looking at the PGM R meter. Set so that the needles of the meters attain maximum readings, at which point such readings should not exceed 0 VU.

(2) LINE INPUT 1 – 4
The PAN control corresponding to the connected terminal should be turned fully to the left when the connected audio source signal is recorded onto track 1 or track 3, similarly, the PAN control should be turned fully to the right when recording onto track 2 or track 4. In this way, the input signal is assigned (i.e., sent) to one or the other BUSS.
Next, adjust the level control while looking at the PGM L meter or PGM R meter. Set to that the needle of the meter attain maximum readings, at which point such reading should net exceed 0 VU.

(3) (4) AUX IN L/R, PHONO IN L/R
The AUX IN, as well as the PHONO IN L/R signals, are assigned (sent) just as they are to the BUSS L or R. Adjust the signal level by means of the STEREO INPUT control while looking at the meter. If the L/R balance is poor, or when balancing the level of signals assigned (sent separately to the L and R AUX IN, adjust by means of the BALANCE control.

4. Signals assigned to the BUSS L can be recorded onto either track 1 or track 3. Signals assigned to the BUSS R can be recorded onto either track 2 or track 4.
When recording, slide the REC FUNCTION switch toward the track onto which you wish to record. Once this switch is set, the red LED beneath the switch will begin to flash.
5. Raise the PHONES level to monitor the signal to be recorded.
The PHONES level has no effect on the recording level.
6. When using the MIC/LINE INPUT, adjust the audio quality by means of the EQ knobs.
Adjusting the knobs may result in a change in the input level, so recheck the recording level using the VU meter.
7. Press the Tape Counter Reset button, returning the counter to "000".
8. Set the PITCH CONT knob to the center position.
9. Press the REC button and recording will begin. At this point, the REC FUNCTION LED will light, indicating that the unit is in the record mode.

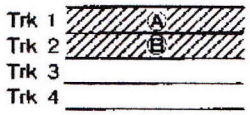
Recording on Track 1 only

Checking the Initial Track Recording

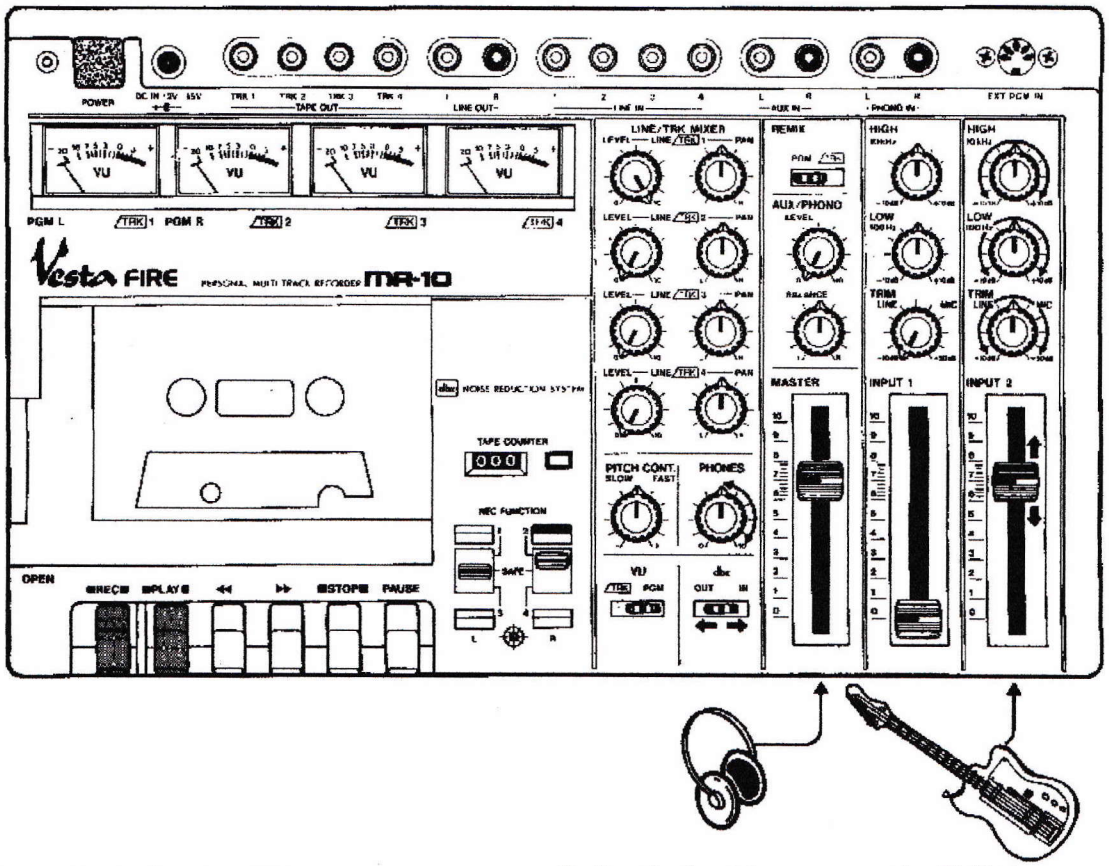
1. Set all RECORD FUNCTION switches to the center SAFE position.
2. Press the REW button (◂◂), rewinding the tape until the tape counter reads "000".
3. Set the REMIX switch to TRK.
4. Pressing the PLAY button and raising the recorded track LEVEL allows you to listen to the recording through the headphones. The orientation of this audio can be adjusted using the PAN control.

Overdubbing

When the initial track recording has been completed, play back the initial track and record a new source onto another track while monitoring the operation through the headphones.



Example Setting : Record onto track 2 while monitoring the track 1.



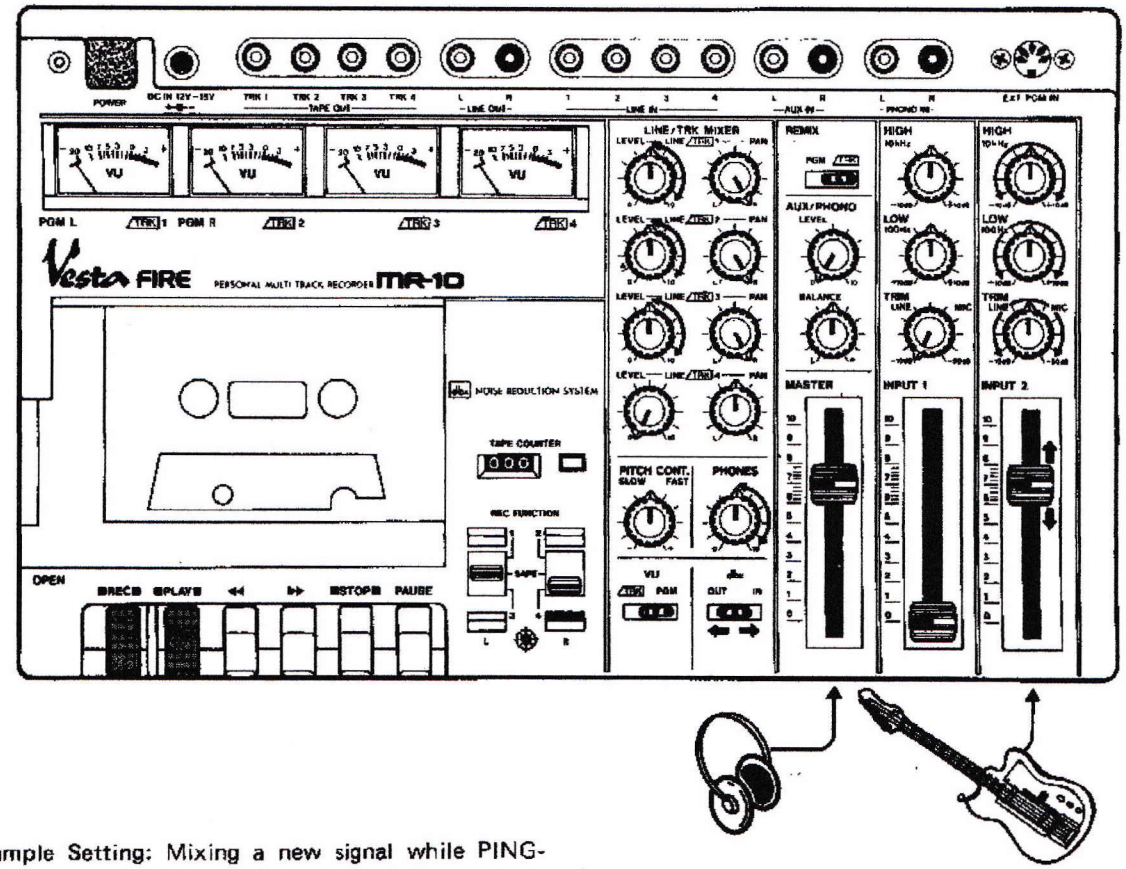
1. Choose the track onto which you wish to record. For example, if you have used track 1 for the initial track recording, select either track 2 or track 4. (The example used track 2).
2. Connect the audio source to be recorded to the input terminal. When recording onto track 1 or track 3, or when recording 2 or 4 tracks simultaneously via AUX IN L, use MIC/LINE INPUT 2 or AUX IN R.
   LINE IN 1 – 4 cannot be used when OVERDUBBING.
3. Check to make sure that the VU switch is set to PGM, and adjust the input level while looking at the VU meters, as when making an initial track recording.
4. Set the REMIX switch to PGM.
   If this switch is on TRK, the signals of the previously recorded track will be PING-PONGED onto the track onto which you wish to record.
5. Set the RECORD FUNCTION switch to the track onto which you wish to record. At this point, make sure that the RECORD FUNCTION LED flashes.
6. Set the headphones, press the PLAY button, and rehearse. At this point, adjust the monitor blance between the played back initial track audio and the overdubbing instruments using the LEVEL control in the LINE/TRK MIXER.
   Avoid using the Master control to change the level of the input signal, as this will distort the recording level.
7. Adjust the EQ as necessary.
8. If the monitor level adjustment and the EQ setting are OK, set the tape to the "000" counter position.
9. Press the REC button and carry out OVERDUBBING.

Checking the Results of the OVERDUBBING

1. Return the REC FUNCTION switches to the SAFE position.
2. Rewind the tape until the counter reads "000".
3. Press the PLAY button and adjust the playback level balance of all tracks using the LEVEL control in the LINE/TRK MIXER. Next, with the unit set on initial track recording, switch only the recording function to track 3 and overdub on track 3 as well.

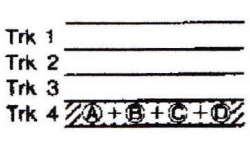
Ping-Pong (Ping-Pong + Overdubbing)

If you want to record 4 instruments, mix the signals of 3 of the pre-recorded tracks and combine them onto the remaining track. Also, the MR-10 allows you to overdub a new instrument at the same time as you are making a PING-PONG recording.



Example Setting: Mixing a new signal while PING-PONGING signals from tracks 1 through 3 onto track 4.

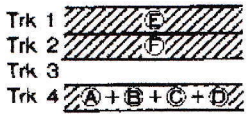
1. Rewind the tape to the start of the PING-PONG recording and reset the counter.
2. Set the REMIX switch to TRK.
3. Press the PLAY button and, while monitoring the already recorded audio, adjust the balance of all track playback, and new signals, using the LEVEL knob in the LINE/TRK MIXER.
4. If you are PING-PONGING onto tracks 1 or 3 turn the PAN knob all the way to the left; if you are PING-PONGING onto tracks 2 or 4, turn the PAN knob all the way to the right.
5. Check to make sure that the VU meter switch is set to PGM and, while looking at the VU meter, adjust the level so that the maximum reading does not exceed 0 VU using the master fader control.
   Recordings with superior signal-to-noise ratios can be obtained if at this time the master fader control is at 7 – 8. When this control is set at either an extremely low or extremely high position, adjust the overall level of each track using the LEVEL control and adjust to the best setting possible.
6. Set the RECORD FUNCTION switch to the track onto which you will be combining tracks. At this point, check to make sure that the RECORD FUNCTION LED flashes.
7. Rewind the tape until the counter reads "000".
8. Press the REC button and begin PING-PONG recording.
9. When recording is finished, rewind the tape, play it back, and check the results.



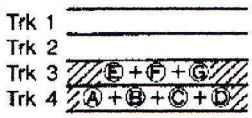
Pingponging A , B , & C
to TRK 4 while overdubbing D

With the completion of PING-PONGING, the signals recorded on tracks 1 — 3 are no longer needed. In other words, PING-PONGING opens up 3 tracks. Using the now-empty tracks, repeat the operation "record → PING-PONG + OVERDUBBING" as in the following diagram.

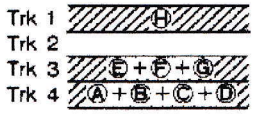
Record E, F, on tracks 1 and 2



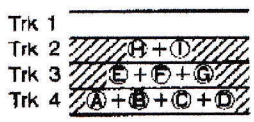
While PING-PONGING E, F, onto track 3, OVERDUB G



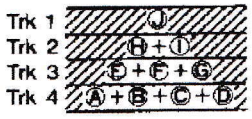
Record H on track 1



While PING-PONGING H onto track 2, OVERRDUB I



Record J on track 1 (completed)



PUNCH-IN/PUNCH-OUT

In the event that you make an error in on part of a recording during initial track recording or OVERDUBBUING, the MR-10 allows you to redo that section.

Example: Amending a portion of track 1

A) Using the FP-1 Remote Pedal

1. Use the same settings as for OVERDUBBING (items 1 – 8).
2. Press the REC button. Make the necessary corrections, in keeping with the recorded portion. At this point, the RECORD FUNCTION LED should blink.
3. Press the foot switch for the section you wish to correct; the RECORD FUNCTION LED will remain on and recording will begin.
4. When correction is finished, press the foot switch once again (turning it off).

NOTE: Always start with the foot switch off, if you start in on a correction with the foot switch on, you will erase your tape. In order to ascertain whether the foot switch is on or off, remember that with the unit in the REC PAUSE mode the FUNCTION LED flashes when the foot switch is off and remains on when the foot switch is on.

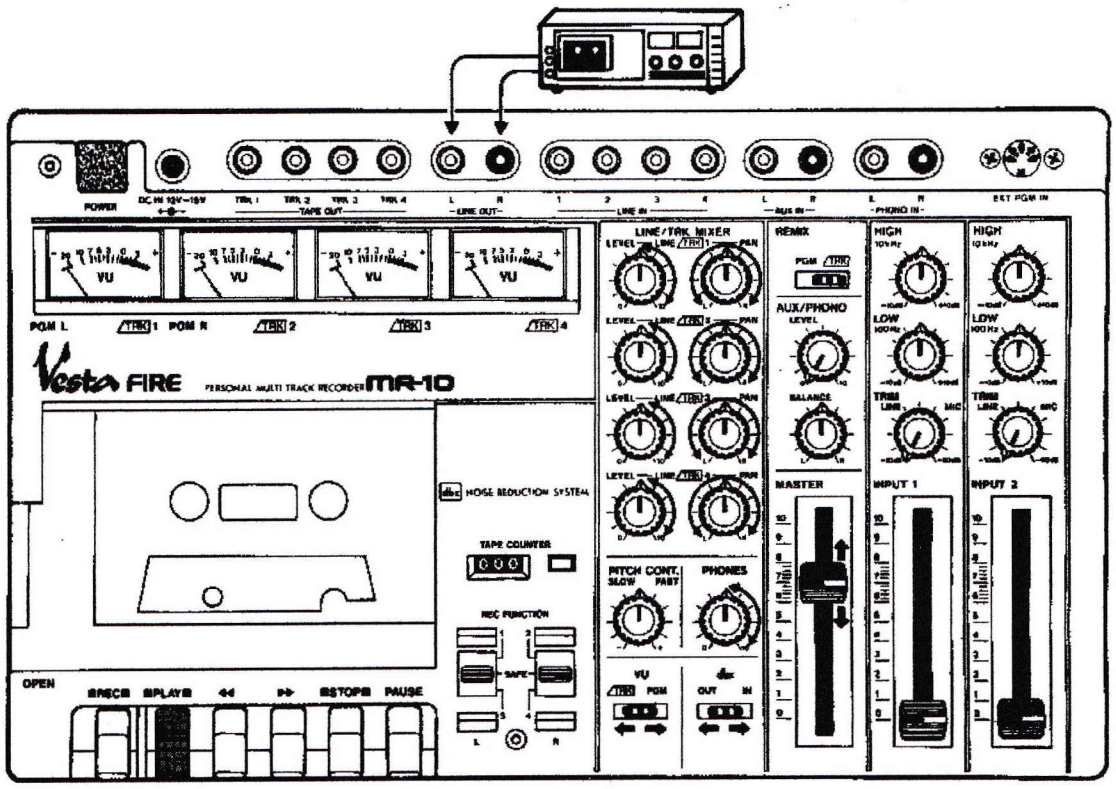
There are 2 types of foot switches on the market; the momentary type (which does not lock) and the alternate type (which does lock). Because the MR-10 allows PUNCH-IN only when the foot switch is on, the following obtains:

Momentary Type: PUNCH-IN only as long as the foot switch is pressed and held down; release allows PUNCH-OUT.

Alternate Type: Press the foot switch once allows PUNCH-IN; press once again allows PUNCH-OUT.

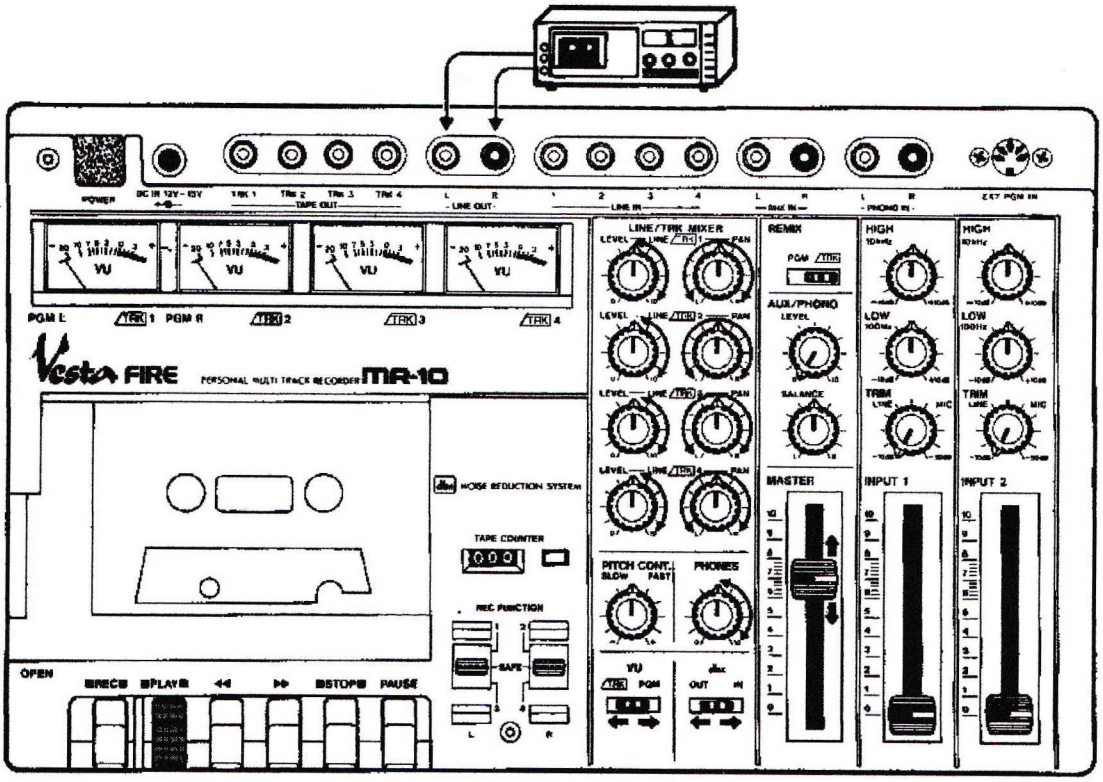
B) Without using the foot switch

1. Follow the procedures 1 – 8 in Overdubbing.
2. Press the PLAY button and start playing the musical intrument to the pre-recorded tracks, while the REC FUNCTION LED blinks.
3. Press the REC button when you reach the point just before the error. The recording begins and the REC FUNCTION LED is lit.
4. When the Punch-In has performed correctly, press STOP.



Mixdown

When all recording is finished, mix all 4 tracks onto stereo (2 channel) and dub.



1. Connect a stereo cassette deck, etc., and a dubbing deck to LINE OUT L/R.
2. Set the REMIX switch to TRK.
3. Set both RECORD FUNCTION switches to the central SAFE position.
4. You can check the level of the signal to be dubbed if the VU Meter is set to PGM; similarly, you can check the playback of each of the tracks if the VU meter is set to TRK.
5. While monitoring the recording through the headphones, blance all track levels using the LEVEL knobs and orient all track playback using the PAN knobs in the LINE/TRK MIXER.
6. Adjust the output level using the MASTER Fader. ***At this point, the finest dubbing can be obtained by setting the MASTER Fader control at 7 – 8. When this control is set at either an extremely low or extremely high position, adjust the overall level of each track using the TAPE-LEVEL control and adjust to the best setting possible.***
7. Rewind the tape, press the PLAY button, and begin dubbing.
8. FADE-IN and FADE-OUT are carried out via the MASTER Fader control.

Addition of Special Effects during MIXDOWN

Sound effects can be mixed in with the recording when mixing down by using the rich array of input and output jacks with which this unit is equipped.

1. Connect the TAPE OUT jacks 1 – 4 with the effect device's input, and connect output with LINE IN.
2. Mixing of dry and effect and the level returning to the main unit should be adjusted first on the effect device.
3. Set the combined level of the sound effects input from the LINE IN and the playback from the playback head at the Line/Track Mixer Level, and locate the signal anywhere in the stereo panorama via the PAN.
4. The signal with the sound effect is now output from LINE OUT L/R.

Specificaticatıons

NECHANICAL CHARACTERISTICS

Tape	Compact cassette C-30 to C-90, 70μs, Hi-bias (Type Ⅱ) tape
Track Format	4 track, 4-channel
Head Configuration	2 heads (erase and record/ reproduce)
Motor	1 DC Motor
Tape Speed	4.8 cm/s (1-7/8 ips) ±1%
Pitch Control	±15%
Wow and Flutter	0.12% (JIS, WTD)
Fast Winding Time	Approx 100 seconds for C-60
Dimensions	336 x 64 x 205 m/m (W.H.D.)
Weight	2kg

ELECTRICAL CHARACTERISTICS

MIXER SECTION

Mic/Line Input (x2)	φ6.4 (1/4") Phone Jack, unbalanced
Input Impedance	10 kohms
Nominal Input Level	-50 to -10 dBV (Trim Max to Mim)
Phone Input (L/R)	RCA Phono Jack
Input Impedance	10 Kohms
Nominal Input Level	-54 dBV (at 1kHz)
Line Input (L/R)	RCA Phone Jack
Input Impedance	10 Kohms
Nominal Input Level	-10 dBV
Line Input (x 4)	RCA Phono Jack (Remix On-Track)
Input Impedance	10 Kohms
Nominal Input Level	-10 dBV
Line Output (L/R)	RCA Phono Jack
Output Impedance	1 Kohms
Nominal Output Level	-10 dBV
Tape Output (x 4)	RCA Phono Jack
Output Impedance	1 Kohms
Nominal Output Level	-10 dBV
Headphone Output (L/R)	φ6.4 (1/4") Phone Jack
Nominal Load Impedance	8 ohms
Maximum Output Level	100 mW
Equalizer	
Type	Shelving
Frequencies	Low: 100 Hz High: 10 kHz
Boost/Cut Range	±10 dB

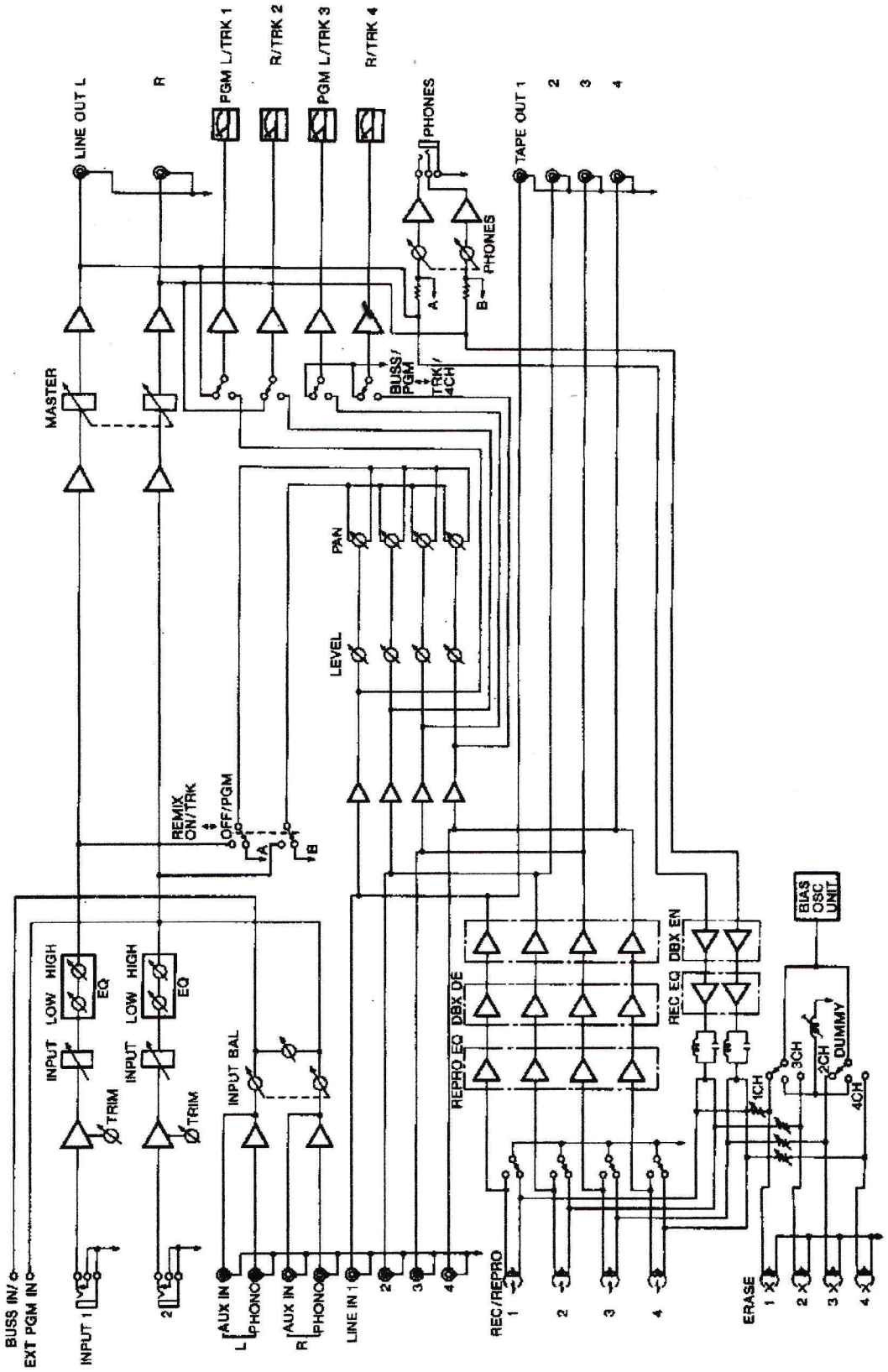
RECORDER SECTION

Record Channel	2 (2 dbx Ⅱ NR switchable)
Playback Channel	4 (4 dbx Ⅱ NR switchable)
Bias Frequency	80 kHz
Equalization	3180 μs + 70 μs
Power	AC Adaptor (15V, 400 mA)

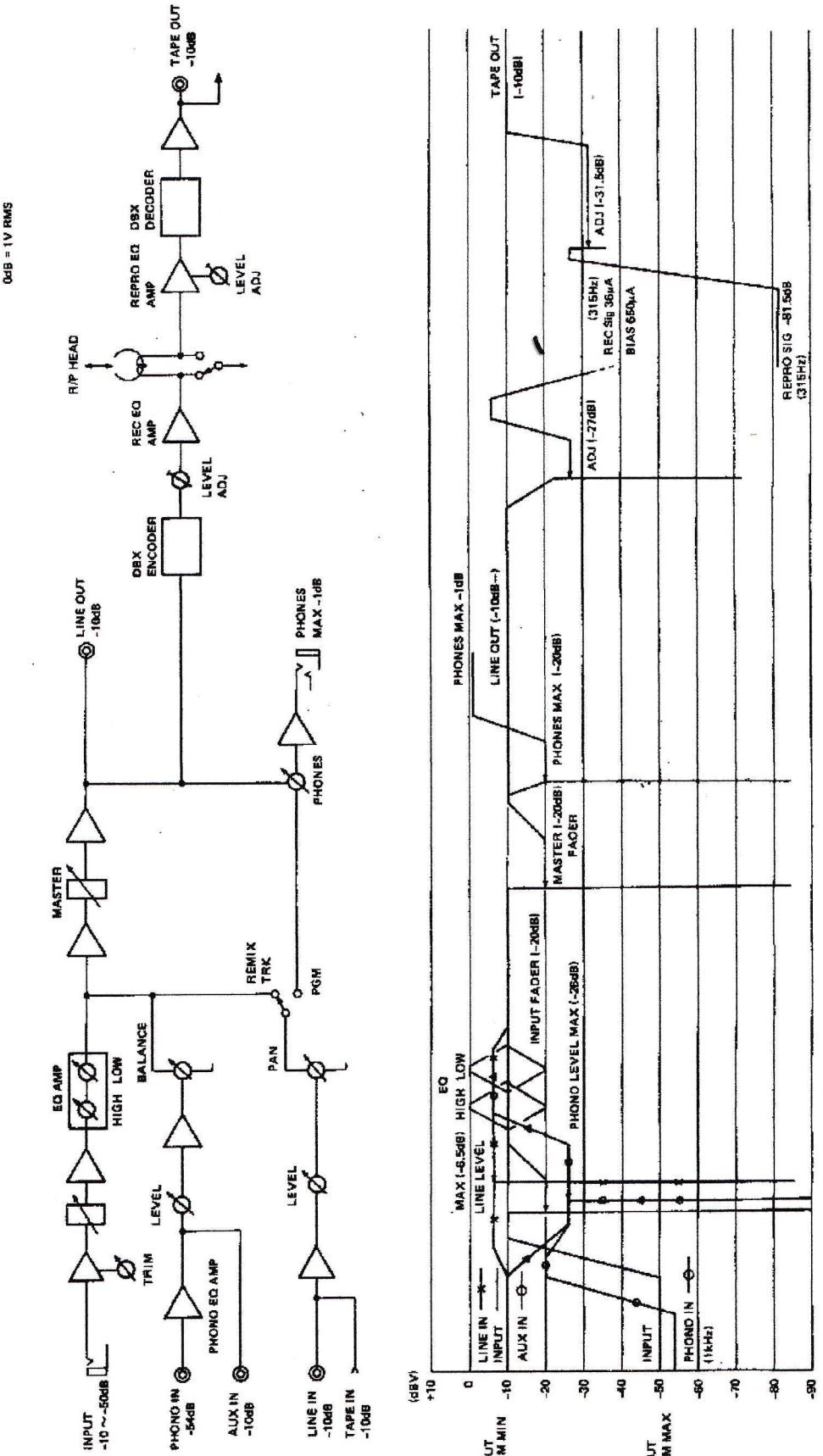
PERFORMANCE CHARACTERISTICS

Frequency Response	40 Hz — 12.5 kHz ±3 dB
T.H.D.	1.0% 0VU, 1 kHz with dbx 3.0%, 8 dB above 0VU, 315Hz with dbx
S/N Ratio	85 dB (WTD, with dbx)
(Referenced to 3% THD level at 315 Hz)	
Adjacent Channel Separation	55 dB, 1kHz, 0VU, with dbx
Erasure	70 dB at 1 kHz
(Reference to 3% THD)	

Block Diagram



Level Diagram



Accessories

FP-1 PUNCH IN/OUT Remote Pedal
PS-15 AC ADAPTOR*
(DC-15 AC ACAPTOR)*
BP-10 Battery Pack (Not Available)
EX-10Expander Unit (Not Available)

*AC Adaptor is necessory for MR-10 operation.
*Trademarks: dbx, dbx Incorporated.
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Changes in specifications and features may be made without notice or obligation.

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